Notes on the Trees of the South-west.*—*Quercus Emoryi*, Torr., known as the "black oak," is very common in the country of the Upper Gila. It never grows on the hills, nor far from the beds of the streams, though these may be dry during the greater portion of the year. It delights in a fine gravelly, or sandy soil in open cañons. Although the growing wood is not subject to decay, as is the case with the other oaks of this section, I do not know that it is highly esteemed. It is here a tree 40 or 50 feet in height, and proportionately stout. Its thick, dark, and glossy foliage would make it a very handsome tree, but for the scraggy appearance given it by its dead twigs and branches. Its acorns furnish the principal September food supply of large flocks of wild pigeons.

Quercus hypoleuca, Engelm.—This handsome little tree I have observed in the Bear Mountains. It scarcely exceeds 15 feet in height, the trunk being stout for the size of the tree. Its long, elegantly pointed, dark green leaves, silvery below, render it handsome in spite of its gnarled and twisted trunk and branches. It grows only in deep cañons, and in the rockiest places. It would be a great favorite as an ornamental tree in those sections where it could be successfully cultivated.

Quercus undulata, Torr., grows sparingly in the Bear and Burro Mountains, and very abundantly in the Mogollon Mountains, where, with the sycamore, it forms about five-sixths of the tree-flora of the cañons. The young wood is quite tough and strong; but, as it grows older, it soon becomes brittle and subject to decay. The trunks and main branches, like those of *Platanus*, are much twisted, and bent or arched. It grows only in the bottom of the cañons.

Quercus grisea, Liebm.—This is comparatively a rare tree in the sections which I have visited. A few trees grow in the San Francisco Mountains, and it is rather frequent in the Bear Mountains. Its smaller leaved forms approach the next species in appearance, but it seems to be distinguished from that by its more abrupt manner of taking on fresh foliage; while in the color and appearance of its bark, and the habit of the tree, it is much like *Q. hypoleuca*. I did not see the fruit.

Quercus pungens, Liebm.—I am somewhat in doubt as to whether the plants which I have called by this name do not constitute two species, one a good-sized tree, the other shrubby. This tree, if we include its shrubby forms, is probably more abundant than any other in the basin of the Upper Gila, and the adjacent country. It does not grow upon the plains, but is everywhere abundant in the mountains. It clothes many of the gravelly hills, from base to summit, with a dense thicket of scraggy growth. On the higher summits it is not common, while in partial shades in the cañons and near water, it becomes a good-sized, though rather low tree. Its form is strikingly like that of a well-grown apple-tree; and a gentle slope, or grassy hollow dotted with good-sized, scattered specimens reminds one strongly of a New England orchard, and is a sight which a lover

*Continued from page 53. In making up the April number of the BULLETIN, Mr. Rusby's name was accidentally omitted from his communication, and the omission was overlooked by us till it was too late to rectify the error.—ED.

of fine trees delights to look upon. Probably no tree is more generally unsound at the heart, yet one must be experienced to detect the indications of such a state. It is difficult to find a sound specimen, except where the roots have access to a permanent water-supply, and then only among young trees.

Alnus oblongifolia, Torr.—With the exception of the Coniferae, this occasionally becomes the largest tree of the South-western Rocky Mountain region, though the average size is less than that of the next. It is common and abundant along nearly all mountain streams, growing only at the very edge of the water. It is well-proportioned and handsome. The wood is brittle, decays rapidly, and is fit only for firewood.

Populus Fremontii, var. (?) *Wislizeni*.—A magnificent tree, abundant along all streams in the open country, or in the open parts of the cañons. Toward the heads of the cañons, or where they are narrow and precipitous, it is rarely found. Like other cottonwoods, this species flourishes where no others grow, and is hence one of the most valuable trees.

Juniperus occidentalis, Hook., var. *monosperma*, Engelm.—One of the most abundant trees of Southern New Mexico, growing occasionally in cañons, but mostly on low hills with the next, and with *Pinus edulis*, these three species constituting almost the entire tree-flora of the hilly country. It becomes something more than a "small tree," though it is never tall. In some sections it is almost the only tree.

Juniperus pachyphloea, Torr.—Everywhere abundant in the mountains and hills. The large, sweet fruit is extensively eaten by bears and coyotes, and, I believe, by foxes (!) and deer.

Cupressus Arizonica, E. L. Greene.—This fine tree I have seen only in the San Francisco Mountains, where it is quite abundant, growing both in cañons and upon the highest mountains, on the northern slopes. Where it grows in thick patches, it becomes tall and straight, much resembing, at a distance, the balsam fir. Single specimens branch widely, and assume handsome forms. The largest that I have seen measured about forty inches in diameter. It possesses great value as a timber-tree, being evidently adapted to varying conditions of soil and climate, the wood being light, strong, straight-grained, and apparently durable. Its handsome form and color, and the sprightly disposition of its foliage would render it a favorite upon the lawn. Growing upon so limited an area, in a lively mining district, where great numbers of the trees are being continually cut for fuel, both as wood and charcoal, it is not sufficiently protected, and it is strongly advisable to introduce it into other sections.

Pseudotsuga Douglasii, Carr.—The principal species constituting the large and dense forests which clothe the higher portions of the Mogollon Mountains. In the deep and shady cañons it descends almost to the base of the mountains, the largest specimens growing in such locations. Unless two species have been observed, two distinct forms grow here, one with the very glaucous leaves shorter and more rigid and crowded. The bark of the latter is thicker, and is more deeply furrowed than in any other species with which I am acquainted.

Pinus reflexa, Engelm.—Seen only in the higher portions of the Mogollon Mountains, where it grows sparingly. The trunk is tall, slender, crooked, and very flexible, with a few branches at the top. The large, somewhat flattened seeds are fully as sweet and rich as those of *Pinus edulis*.

Picea Engelmanni, Engelm., grows sparingly in the Mogollon Mountains, and only on the highest summits. It forms a compact and handsome top.

Ephedra antisyphilitica, C. A. Meyer, becomes a small tree of 12 or 15 feet in height, and 5 or 6 inches in diameter, along the Rio Grande. It is apparently worthless.

HENRY H. RUSBY.

Contributions toward a List of the State and Local Floras of the United States.

III. THE SOUTH-EASTERN STATES.

Manual of Botany adapted to the productions of the Southern States. By John Darby, A.M. (D.)
12mo., 612 pp. Macon, Ga., 1841, and New York, 1866.

Musci Alleghanienses, sive spicelegia Muscorum atque Hepaticarum quas in itinere a Marylandia usque ad Georgiam per tractus montium, A. D., 1843, decerpserunt Asa Gray et W. S. Sullivant. By W. S. Sullivant. (C.)
12mo., 87 pp. Columbus, Ohio, 1846.

Flora of the Southern United States, containing abridged descriptions of the flowering Plants and Ferns of Tennessee, North and South Carolina, Georgia, Alabama, Mississippi and Florida. By A. W. Chapman, M.D. (D.)
8vo., 621 pp. New York, 1860.

Enumeration of the species issued in the first and second centuries of Ravenel's "Fungi Caroliniani Exsiccati," with other species collected at the same time in insufficient quantities for distribution. By M. C. Cooke. (C.)
In Grevillea, Vols. vi and vii. London, 1877–'79.

VIRGINIA.

Flora Virginica, exhibens Plantas quas v. c. Johannes Clayton observavit atque collegit. Easdem methodo sexuali disposuit, ad genera propria retulit, nominibus specificis insignivit minus cognitas descripsit Joh. Fred. Gronovius. (D.)
8vo., pp. 206. Leyden, 1739–1743.

Catalogue of Plants observed by John Bannister in Virginia. (A.)
In Ray's Historia Plantarum, Vol. ii. London, 1688.

WEST VIRGINIA.

Flora of West Virginia. By H. N. Mertz and G. Guttenberg. (A.)

List of Timber Trees of West Virginia. By J. H. Diss Debar. (B.)
In Handbook of West Virginia.

Forest Trees, Shrubs and medicinal Plants of West Virginia. By W. M. Fontaine. (B.)
In Resources of West Virginia, p. 111. Wheeling, 1876.

List of medicinal Plants growing in West Virginia. By Dr. A. S. Todd. (A.)
In Trans. Med. Soc'y of W. Va., for 1867 and 1871.